

Elements and Ephemeris of Zona's Comet.

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The following orbit depends upon an observation at Rome on November 16, one by Baron von Engelhardt on the 18th, and the Paris observations on the 21st:—

Perihelion passage, 1890, August 8.43592 G.M.T.

Longitude of perihelion ...	...	...	113° 16' 52".1	} Appt. Eq. Nov. 20.
„ Ascending node ...	...	...	85 25 2.7	
Inclination ...	...	...	25 38 57.4	
Log perihelion distance ...	...	...	0.3138092	

Motion—retrograde.

The middle observation is thus represented  $\Delta\lambda \cos \beta (c-0) = +0''.3$ ,  $\Delta\beta = +2''.0$ .

Ephemeris for Greenwich Midnight.

1890.	R.A.	Decl.	Log $\Delta$
Dec. 10	h m s	°	
10	3 15 4	+33 57.7	0.2072
12	3 5 58	33 35.2	
14	2 57 26	33 11.1	0.2252
16	2 49 27	32 45.9	
18	2 42 0	32 19.9	0.2449
20	2 35 4	31 53.6	
22	2 28 38	31 27.4	0.2658
24	2 22 42	31 1.5	
26	2 17 14	+30 36.0	0.2872

The intensity of light on December 10 = 0.74, and on December 26 = 0.47, that on November 16 being taken as unity.

*Ephemerides of the Satellites of Saturn, 1890-91.*

By A. Marth.

(Concluded.)

Approximate Greenwich times of conjunctions of the satellites with the ends of the ring. In order to get the question settled whether the shadows of Tethys, Dione, and Rhea are discernible on the disc of *Saturn*, some of the times are added when the axes of the shadow-cones cross the central meridian.

1891.	h		h		h	
May 16	8.8 Te. pn		May 22	8.6 Te. w	May 28	8.4 Te. ps
	10.6 Mi. pn			10.5 En. fs		10.8 Mi. fn
	11.5 Di. ps			12.2 Rh. w		14.5 En. pn
	15.6 En. ps			13.6 Mi. fs		15.4 Te. fs
	16.0 Mi. ps			16.4 Te. ps		16.7 Mi. pn
	16.1 Rh. fn		23	7.3 Te. e		19.1 Di. fn
	16.7 Te. w			7.7 Di. fn		19.3 Tit. inf. $\delta$
17	7.5 Te. fs			10.8 Rh. ps		n. 17"
	7.8 Di. e			12.3 Mi. fs	29	1.0 Tit. Shadow
	9.0 En. fn			12.4 Di. Shadow		near north limb
	9.2 Mi. pn			13.0 En. ps		7.0 Te. fn
	14.6 Mi. ps			15.1 Te. fn		9.4 Mi. fn
	15.3 Te. e			15.5 Di. pn		11.1 Te. Shadow
	15.4 En. pn			17.7 Mi. fn		14.0 Te. pn
18	13.2 Mi. ps			19.1 Te. Shadow		15.3 Mi. pn
	14.0 Te. w		24	10.9 Mi. fs		15.4 Di. w
	16.6 Di. w			11.8 En. pn		17.0 En. fn
	17.9 En. fn			13.8 Te. ps	30	9.5 En. ps
19	7.3 Rh. fs			16.3 Mi. fn		11.5 Rh. Shadow
	10.3 En. ps			16.6 Di. ps		11.8 Di. fs
	11.9 Mi. ps			18.4 Rh. e		12.7 Te. fs
	12.6 Te. e		25	9.5 Mi. fs		13.9 Mi. pn
	13.0 Di. fs			12.4 Te. fn		14.5 Rh. pn
	16.7 En. fs			12.9 Di. e		15.8 En. fs
20	9.1 En. pn			14.3 En. fn	31	8.3 En. pn
	10.5 Mi. ps			14.9 Mi. fn		8.4 Te. Shadow
	11.3 Te. w			16.5 Te. Shadow		11.4 Te. pn
	14.0 Di. fn			17.0 Rh. fn		12.5 Mi. pn
	16.4 Mi. fs		26	6.1 Di. Shadow		12.8 Di. fn
	18.7 Di. Shadow			6.8 En. ps		13.1 Rh. w
21	2.4 Tit. sup. $\delta$			8.1 Mi. fs		17.6 Di. Shadow
	s. 18"			9.2 Di. pn	June 1	9.1 Di. w
	8.1 Tit. close			11.1 Te. ps		10.0 Te. fs
	approach to			13.2 En. fs		10.8 En. fn
	shadow-cone			13.5 Mi. fn		11.2 Mi. pn
	of Saturn		27	9.7 Te. fn		11.7 Rh. ps
	9.1 Mi. ps			10.3 Di. ps		16.6 Mi. ps
	10.0 Te. e			12.1 Mi. fn		17.2 En. pn
	10.3 Di. w			13.8 Te. Shadow		17.9 Te. e
	10.5 Rh. Shadow			15.7 En. ps	2	8.7 Te. pn
	11.7 En. fn			16.7 Te. pn		9.6 En. fs
	13.6 Rh. pn		28	6.6 Di. e		9.8 Mi. pn
	15.0 Mi. fs			8.1 En. fn		15.2 Mi. ps
	17.8 Te. fn			8.3 Rh. fs		16.5 Te. w

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